User manual

LD200

Description

LD200 is a universal position display which allows to connect 7 different types of encoders or sensors. The user interface is a multifunction keyboard with 4 push-buttons and a 7 segment LED display with 8 digits and 3 status LEDs.
The display has a RS232 interface for connection to a PC.

Chapters

1 Safety summary
2 Identification
3 Mounting recommendations
4 Electrical connections
5 Functions
6 Setup

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1 - Safety summary

Safety

- observe the professional safety and accident prevention regulations applicable to your country during device installation and operation;
- installation has to be carried out by qualified personnel only, without power supply and stationary mechanics parts;
- the encoder must be used only for the purpose appropriate to its design;
- high current, voltage and rotating parts can cause serious or fatal injury.

Electrical safety

- switch OFF the voltage before connecting the device;
- connect according to the chapter "Electrical connections";
- according to the 89/336/CEE norm on electromagnetic compatibility, following precautions must be taken:
  - before handling and installing, discharge electrical charge from your body and tools which may come in touch with the device;
  - power supply must be stable without noise, install EMC filters on device power supply if needed;
  - always use shielded and twisted cables if possible;
  - avoid cables runs longer than necessary;
  - avoid running the signal cable near high voltage power cables;
  - mount the device as far as possible from any capacitive or inductive noise source, shield the device from noise source if needed;
  - minimize noise by connecting shield to ground (GND). Make sure that ground (GND) is not affected by noise. The shield connection point to ground can be situated both on the device side and on user's side. The best solution to minimize the interference must be carried out by the user.

Mechanical safety

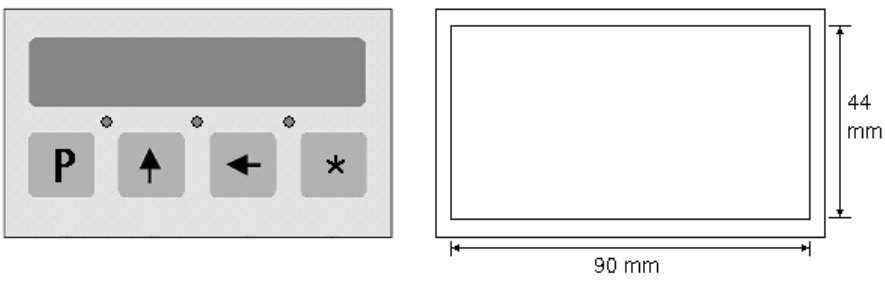
- install according to the section "Mounting recommendations";
- do not disassemble the device;
- do not tool the device;
- do not subject the device to knocks or shocks;
- respect the environmental characteristics of the product.

2 - Identification

The device can be identified by the label's data (ordering code, serial number). This information is listed in the delivery document. For technical features of the product, refer to the technical catalogue.

3 - Mounting recommendations

Push the display into the cut-out (approx. 90 x 44 mm^2) without panel clips.
Install panel clips on the display's housing and screw until fixed.



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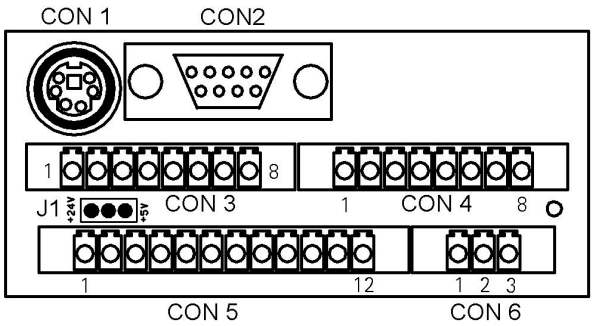
4 - Electrical connections



4.1 CON6 Connections (power supply)

Pin	Vdc	Vac
1	+ 24 Vdc ±20%	18 Vac
2	0 Vdc	18 Vac
3	P.E. (GND)	P.E. (GND)

4.2 CON1 Connections (Mini-DIN connector)

Plug the Mini-DIN circular connector of SM2, SM25 or SM5 sensors on the backside of display.

4.3 CON2 Connections (RS232)

Pin	Function
1	n.c.
2	TxD
3	RxD
4	n.c.
5	0 Vdc
6, 7, 8, 9	n.c.

4.4 CON3 Connections (SIN/COS 1Vpp)

Pin	Function
1	0 Vdc
2	+5 Vdc
3	SIN+
4	SIN-
5	COS+
6	COS-
7	REF+
8	REF-

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4.5 CON5 Connections (Push-Pull, Line Driver, SSI)

Pin	Function
1	0 Vdc
2	+Vdc *
3	A
4	/A
5	B
6	/B
7	0
8	/0
9	Data+ (SSI)
10	Data- (SSI)
11	Clock+ (SSI)
12	Clock- (SSI)

*: encoder power supply selectable with jumper J1.

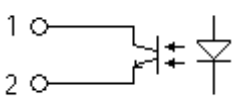
4.6 Jumper J1 (encoder power supply)

Position	Function
Left (1-2)	+Vdc = +24 Vdc@1A
Right (2-3)	+Vdc = +5 Vdc@150mA

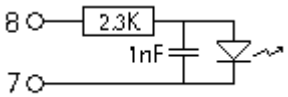
4.7 CON4 Connections (Input and Outputs)

Pin	Description
1	OUT1+
2	OUT1-
3	OUT2+
4	OUT2-
5	OUT3+
6	OUT3-
7	Preset Input-
8	Preset Input +

Digital outputs



Digital input



Outputs are open collector with optocouplers, Imax=23mA.
Input with optocoupler, Vin max=30 Vdc.

ATTENTION:
Connection examples see chapters 5.9 and 5.10.

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5 - Functions

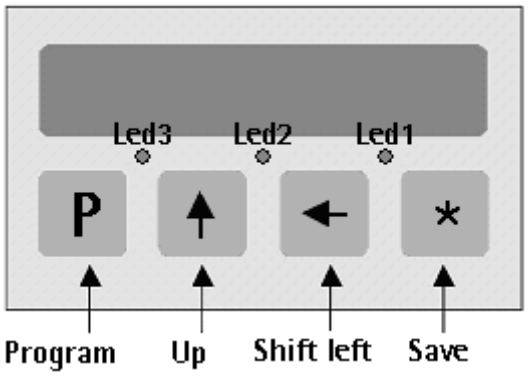
5.1 Start up

At start up the unit shows the hard/software version followed by device address and actual position.

	Hardware version	Software version
Version:	H - x	S - y

Device address (0... 31): AD zz
(used in RS232 interface)

5.2 Key and LED functions



LED	Function
LED1	OFF = mm or degree measurement ON = inch measurement
LED2	OFF = absolute display mode ON = relative display mode
LED3	no function

Key	Function
P	Program (scroll menu)
↑	UP (change value)
←	Shift left (select digit)
*	Save (save data)

5.3 Default parameters (factory settings)

Default parameter values are written in **BOLD** characters.
The unit can be reset to default values following the steps below:

- pushing **P** and ↑ key while switching on;
- setting to datum (see chap. 5.8).

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5.4 Absolute/relative mode

Push **P** and * keys to change from absolute (LED2=OFF) to relative display mode (LED2=ON). Default display mode is absolute.

5.5 Memory on power down (for incremental and 1Vpp sensor/encoder)

On power down the device store the last position on internal memory.

ATTENTION:
If connected encoder will be move during power off, at the next start up the device will display the stored position, not new position.

5.6 Offset

Push ↑ key add the offset value to the actual position.
Refer to parameters for **Offset** value settings.
Display value = actual position + Preset value + Offset value.

5.7 Mm/Inch/Fractional inch display modes

Display mode can be changed from mm to inch and to fractional inch by pushing ← key for 3 s.
Default display mode is mm.

5.8 Set datum (or Preset)

Reset function can be activated by:

- keys: push * key for 3 sec to access Preset function ("**Reset**" will be displayed). Push **P** key to exit function (no reset). Push * key twice to confirm datum value;
- Preset digital input: see chapter 5.9;
- Encoder Zero signal: refer to "**Enable 0**" parameter.

Setting to datum in absolute counting mode has also effect on relative counting mode (see chap. 5.4).
Setting to datum in relative counting mode has no effect on absolute counting mode (see chap. 5.4).
Display value = 0 + Preset value

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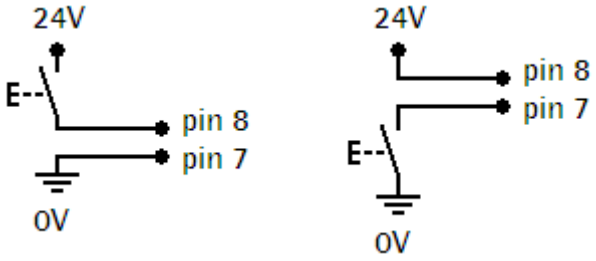
5.9 Preset Input function (CON 4, pin 7 e 8)

The Preset input function is used to execute the Set datum function. The Preset signal has to be logic level HIGH (from +10Vdc to +30Vdc) for 100 msec. minimum.
Refer to "**Enab. In**" parameter to enable this function.
Display value = 0 + Preset value

Recommended wiring diagrams:



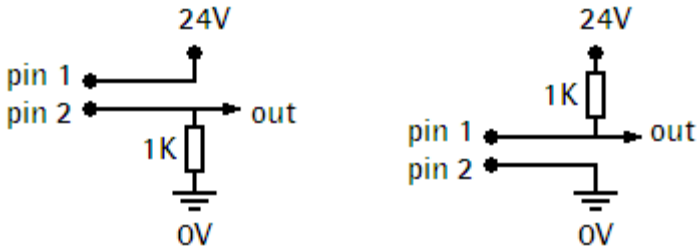
5.10 Output OUT1, OUT2, OUT3 function (CON 4)

OUT1 and OUT2 can be used to set upper and lower software limit switches. See parameters for **Limit_P** and **Limit_N** settings.
OUT3 can be used for zero setting an absolute encoder/ sensor with zero-setting input. OUT3 is a high-level pulse with duration of 100ms.

Output	Function
OUT 1	**ON** if actual position is > LIMIt_P **OFF** if actual position is < LIMIt_P
OUT 2	**ON** if actual position is < LIMIt_N **OFF** if actual position is > LIMIt_N
OUT 3	**ON** when reset command is active **OFF** during normal operation

ATTENTION:
Outputs are open collector with optocouplers, Imax=23mA.

Recommended wiring diagrams:



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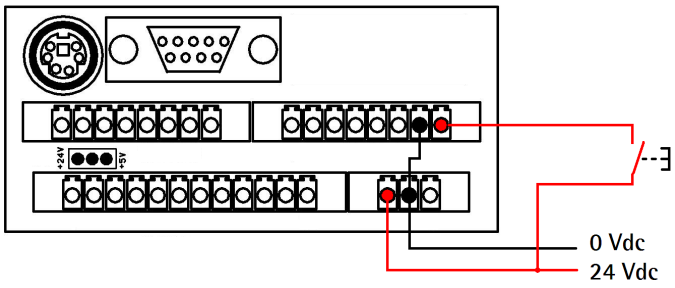
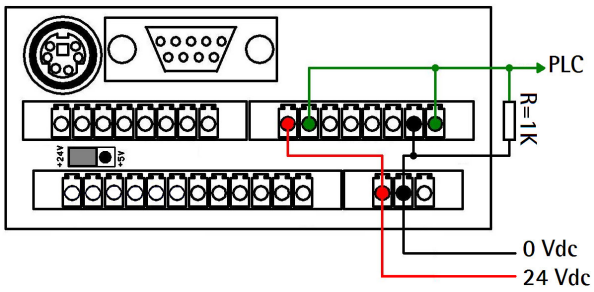
Example:

In the following example the "Enable Preset Input" function has been enabled: Enab.In = ON.

- Using a remote button to perform Preset function (any encoder connected):



- Using OUT1 (Limit_P) to set a digital output for PLC and simultaneously perform a Preset function:



In this case, the high-level signal for PLC has a duration of 160ms.

6 - Setup

6.1 Access to setup menus

Push **P** key for 3 sec. to enter **Setup**.

- push * to enter **"Basic settings"**
- push ↑ to enter **"Parameter settings"**

Push **P** to scroll the menu, first appears the name of the parameter, pushing **P** again appears the set value.
Change value with ↑ and ← keys.
Push * to store parameters and values. Displayed value stops blinking if stored correctly.
Admissible value range for each parameter is listed as follows:
[min. value, max. value] (default value)
All parameters must be set (or scrolled) to exit setup.

NOTE:
An application software is available for parameter setup through RS232 interface (CON2 connections) on web site:
www.lika.biz > PRODUCTS > POSICONTROL.

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6.2 Basic settings

Ad Device address [01, 31] (def: **0**)
Sets the device address for RS232 communication.

L_int Led intensity [0, 15] (def: **10**)
Set intensity of 7 segment LEDs. Use ↑and ← keys to change parameter value.
0 = minimum intensity
...
10 = normal intensity
...
15 = maximum intensity

6.3 Parameter settings

D_type Device type
[E_Incr, E_1Vpp, E_SSI, M_sens, M_Incr, M_1Vpp, M_SSI] (def: **E_Incr**)

Sets the type of sensor connected to the display.

d_tYPE	Type of sensor
E_Incr	Incremental rotary encoder AB0 (see 6.4)
E_1Vpp	Incremental rotary encoder sin/cos 1Vpp (see 6.5)
E_SSI	Absolute single/multiturn SSI encoder (see 6.6)
M_Sens	Magnetic sensor Lika series SM2, SM25, SM5 (6.7)
M_Incr	Linear incremental sensor/encoder AB0 (see 6.8)
M_1Vpp	Linear sin/cos 1Vpp sensor/encoder (see 6.9)
M_SSI	Absolute linear SSI sensor (see 6.10)

Each device type has appropriate parameters relevant only to that specific type of sensor.

ATTENTION:
Preset, **Limit_P**, **Limit_N** and **Offset** values are always managed in metric measurement units (mm).

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6.4 Incremental encoder AB0

D_type Device type [E_Incr]
Parameter list for incremental rotary encoders with Push-Pull or Line Driver circuit (with or without complementary signals).

PPR Pulses per revolution [1, 99999999] (def: **4096**)
Number of pulses per revolution of the encoder.

Dist_r Display value per turn [1, 99999999] (def: **4096**)
Value to be displayed after 1 turn of the encoder.

- this value is entered without decimals
- if Dist_r is > PPR * 4, display value may be irregular (last digit jumps)

Mod 360 360° display mode [OFF, ON] (def: **OFF**)
Sets angular display mode (...0,0°...359,9°...0,0°...).
Display value per turn parameter **Dist_r** has to be set to 360, 3600 or 36000 depending on required decimal point position. Set parameter **Unit** = U_dec.
OFF = display mode not active
ON = angular display mode active

Unit Measurement unit [U_dec, Inch, Inch_F] (def: **U_dec**)
Sets display mode and measurement unit to mm/degrees, inch or fractional inches.
U_dec = mm/degrees (° only with **Mod 360** = ON)
Inch = inch
Inch_F = fractional inches (eg. 12.31.64=12" $^{31}/_{64}$)

EnAbLE 0 Enable Zero signal [OFF, ON] (def: **OFF**)
If "ON", Zero signal of the encoder (pin 7 and 8 of CON5) is used to active Preset function (set datum on rising edge).
OFF = Zero signal not enable
ON = Zero signal enable

Dir Counting direction [Up, Dn] (def: **Up**)
Sets counting direction of display.
Up = standard counting direction
Dn = inverted counting direction

Decimals Decimal point [0, 3] (def: **0**)
Modification of decimal point position. This setting has no influence on other parameters.
0 = 00000000
...
3 = 00000.000

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Preset Datum value [-99999999, 99999999] (def: **0**)
Display can be set to datum value (or preset) by reset procedure.

Limit_P Limit switch + [-99999999, 99999999] (def: **0**)
Value of positive limit switch. Output OUT1 is active (ON) when actual position is higher than set value.

Limit_N Limit switch - [-99999999, 99999999] (def: **0**)
Value of negative limit switch. Output OUT2 is active (ON) when actual position is lower than set value.

Offset Offset value [-99999999, 99999999] (def: **0**)
Offset value (e.g. tool correction). This value is added to actual position by pushing ↑ key.
Position = actual position + offset value

Enab. In Enable Preset Input [OFF, ON] (def: **OFF**)
If "ON", Preset digital input can be used to active Set datum function (see chapter 5.9).
OFF = Input not enable
ON = Input enable

Example:

A I58-H-500ZCU46L2 encoder (with 500 PPR) has to display 10,00 mm each turn, activate the positive limit switch at 30,00 mm and enable the input function.

D_type = E_Incr
PPR = 500 (enc. feature)
Dist_r = 1000
Mod 360 = OFF
Unit = U_dec
EnAbLE 0 = OFF
Dir = Up
Decimals = 2
Preset = 0
Limit_P = 2999
Limit_N = 0
Offset = 0
Enab. In = ON

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6.5 SIN/COS encoder

D_type Device type [E_1VPP]
Parameter list for incremental rotary encoders with 1Vpp sin/cos output circuit.

PPR Pulses per revolution [1, 99999999] (def: **4096**)
Number of pulses per revolution (sine/cosine) of the encoder.

Dist_r Display value per turn [1, 99999999] (def: **4096**)
Value to be displayed after 1 turn of the encoder.

- this value is entered without decimals
- if Dist_r is > PPR * 1024, display value may be irregular (last digit jumps)

Mod 360 360° display mode [OFF, ON] (def: **OFF**)
Sets angular display mode (...0,0°...359,9°...0,0°...).
Display value per turn parameter **Dist_r** has to be set to 360, 3600 or 36000 depending on required decimal point position. Set parameter **Unit** = U_dec.
OFF = display mode not active
On = angular display mode active

Unit Measurement unit [U_dec, Inch, Inch_F] (def: **U_dec**)
Sets display mode and measurement unit to mm/degrees, inch or fractional inches.
U_dec = mm/degrees (° only with **Mod 360** = ON)
Inch = inch
Inch_F = fractional inches (eg. 12.31.64=12" $^{31}/_{64}$)

EnAbLE 0 Enable Zero signal [OFF, ON] (def: **OFF**)
If "ON", Zero signal of the encoder (pin 7 and 8 of CON3) is used to active Preset function (set datum on rising edge).
OFF = Zero signal not enable
ON = Zero signal enable

Dir Counting direction [Up, Dn] (def: **Up**)
Sets counting direction of display.
Up = standard counting direction
Dn = inverted counting direction

Decimals Decimal point [0, 3] (def: **0**)
Modification of decimal point position. This setting has no influence on other parameters.
0 = 00000000
...
3 = 00000.000

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Preset Datum value [-99999999, 99999999] (def: **0**)
Display can be set to datum value (or preset) by reset procedure.

Limit_P Limit switch + [-99999999, 99999999] (def: **0**)
Value of positive limit switch. Output OUT1 is active (ON) when actual position is higher than set value.

Limit_N Limit switch - [-99999999, 99999999] (def: **0**)
Value of negative limit switch. Output OUT2 is active (ON) when actual position is lower than set value.

Offset Offset value [-99999999, 99999999] (def: **0**)
Offset value (e.g. tool correction). This value is added to actual position by pushing ↑ key.
Position = actual position + offset value

Enab. In Enable Input function [OFF, ON] (def: **OFF**)
If "ON", Preset digital input can be used to active Set datum function (see chapter 5.9).
OFF = Input not enable
ON = Input enable

Example:

A I58-V-1024ZCU16 encoder (with 1024 sin/cos each turn) has to display 360.00° each turn and activate the positive limit switch at 359.99°.

D_type = E_1Vpp
PPR =1024 (enc. feature)
Dist_r = 36000
Mod 360 = ON
Unit = U_dec
Enable 0 = OFF
Dir = Up
Decimals = 2
Preset = 0
Limit_P = 35998
Limit_N = 0
Offset = 0
Enab. In = OFF

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6.6 Absolute encoder with SSI output

Absolute/relative display mode function is not active in this device type.

D_type Device type [E_SSI]
Parameter list for absolute rotary single/multiturn encoders with SSI interface.

Format Number of clocks for SSI [13-25, 25-32] (def: **13-25**)
Sets the nr. of clock of SSI protocol.
13-25=13 or 25 clocks (single/multiturn encoders)
25-32=25 or 32 clocks (extended protocol up to 32 bits)

ATTENTION:
extended format is compatible only with "LSB/right aligned protocol" (see "**Prtcl**").

PPR Resolution [1, 33554432] (def: **4096**)
Number of counts per turn (CPR) of absolute encoder.

N_turns Number of turns [1, 4096] (def: **4096**)
Number of turns of absolute encoder.
Set to 1 for single turn encoders.
With programmable encoders set parameter to nr. of hardware turns not to programmed value.

Dist_r Display value per turn [1, 99999999] (def: **4096**)
Value to be displayed after 1 turn of the encoder.

- this value is entered without decimals
- if diSt_r is > PPr, display value may be irregular (last digit jumps)

Prtcl SSI protocol [Shift, Tree] (def: **Tree**)
Type of SSI protocol.
Shift = LSB right aligned protocol
Tree = tree format protocol

Code Encoder output code [Gray, Bin] (def: **Gray**)
Output code of the encoder.
Gray = Gray code (Lika part nr. "GS" or "GR")
Bin = Binary code (Lika part nr. "BS" or "BR")

Unit Measurement unit [U_dec, Inch, Inch_F] (def: **U_dec**)
Sets display mode and measurement unit to mm, inch or fractional inches.
U_dec = mm
Inch = inch
Inch_F = fractional inches (eg. 12.31.64=12" $^{31}/_{64}$)

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Dir Counting direction [Up, Dn] (def: **Up**)
Sets counting direction of display.
Up = standard counting direction
Dn = inverted counting direction

Decimals Decimal point [0, 3] (def: **0**)
Modification of decimal point position. This setting has no influence on other parameters.
0 = 00000000
...
3 = 00000.000

Preset Datum value [-99999999, 99999999] (def: **0**)
Display can be set to datum value (or preset) by reset procedure.

Limit_P Limit switch + [-99999999, 99999999] (def: **0**)
Value of positive limit switch. Output OUT1 is active (ON) when actual position is higher than set value.

Limit_N Limit switch - [-99999999, 99999999] (def: **0**)
Value of negative limit switch. Output OUT2 is active (ON) when actual position is lower than set value.

Offset Offset value [-99999999, 99999999] (def: **0**)
Offset value (e.g. tool correction). This value is added to actual position by pushing ↑ key.
Position = actual position + offset value

Enab. In Enable Input function [OFF, ON] (def: **OFF**)
If "ON", Preset digital input can be used to active Set datum function (see chapter 5.9).
OFF = Input not enable
ON = Input enable

Example:

The absolute position of a encoder series AM5812/4096GS-10 (with 4096 CPR, 4096 turns, Gray code and "tree protocol") has to display 20,00 mm each turn, activate the positive limit switch at 50,00 mm and enable the input function.

D_type = E_SSI
Format = 13-25
PPR = 4096 (encoder feature)
N_turns = 4096 (encoder feature)
Dist_r = 2000
Prtcl = Tree (encoder feature)
Code = Gray (encoder feature)
Unit = U_dec
Dir = Up
Decimals = 2
Preset = 0
Limit_P = 4999
Limit_N = 0
Offset = 0
Enab. In = ON

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6.7 Magnetic sensors SM2, SM25, SM5 series

D_type Device type [M_Sens]
List of parameters for Lika magnetic sensors SMx series with Mini-DIN connector.

Pitch Type of sensor/tape [10, 20, 25, 32, 40, 50] (def: **50**)
Sets the type of sensor and tape used (value indicates the pole pitch of sensor and tape in tenth of mm).
20 = SM2 sensor + MT20 tape (2 mm pole pitch)
25 = SM25 sensor + MT25 tape (2,5 mm pole pitch)
50 = SM5 sensor + MT50 tape (5 mm pole pitch)

Res Resolution [0.001, 0.005, 0.01, 0.05, 0.1, 0.5, 1] (def: **0,001**)
Sets the linear resolution in mm to be displayed.
1 = 1 mm
...
0,001 = 0,001 mm

Unit Measurement unit [U_dec, Inch, Inch_F] (def: **U_dec**)
Sets display mode and measurement unit to mm, inch or fractional inches.
U_dec = mm
Inch = inch
Inch_F = fractional inches (eg. 12.31.64=12" $^{31}/_{64}$)

Dir Counting direction [Up, Dn]
Sets counting direction of display.
Up = standard counting direction
Dn = inverted counting direction

Preset Datum value [-99999999, 99999999] (def: **0**)
Display can be set to datum value (or preset) by reset procedure.

Limit_P Limit switch + [-99999999, 99999999] (def: **0**)
Value of positive limit switch. Output OUT1 is active (ON) when actual position is higher than set value.

Limit_N Limit switch - [-99999999, 99999999] (def: **0**)
Value of negative limit switch. Output OUT2 is active (ON) when actual position is lower than set value.

Offset Offset value [-99999999, 99999999] (def: **0**)
Offset value (e.g. tool correction). This value is added to actual position by pushing ↑ key.
Position = actual position + offset value

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Enab. In Enable Input function [OFF, ON] (def: **OFF**)
If "ON", Preset digital input can be used to active Set datum function (see chapter 5.9).
OFF = Input not enable
ON = Input enable

Example:

A SM5-R-2 sensor connected to a LD200 has to display positions with a resolution of 0,01 mm, a tool correction factor of 5 mm and software limit switches at 0 and 1,5 meter.

D_type = M_Sens
Pitch = 50 (sensor feature)
Res = 0.01 mm
Unit = U_dec
Dir = Up
Preset = 0
Limit_P = 149999
Limit_N = 0
Offset = 500
Enab. In = OFF

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6.8 Linear incremental sensor/encoder AB0

D_type Device type [M_Incr]
List of parameters for linear incremental encoders and sensors with Push-Pull or Line Driver output (with or without complementary signals).

Res Resolution [0.001, 0.002, 0.005, 0.01, 0.02, 0.025, 0.04, 0.05, 0.1, 0.25, 0.5] (def: **0,001**)
Sets the linear resolution in mm to be displayed.
0,5 = 0,5 mm
...
0,001 = 0,001 mm

Unit Measurement unit [U_dec, Inch, Inch_F] (def: **U_dec**)
Sets display mode and measurement unit to mm, inch or fractional inches.
U_dec = mm
Inch = inch
Inch_F = fractional inches (eg. 12.31.64=12" $^{31}/_{64}$)

Enable 0 Enable Zero signal [OFF, ON] (def: **OFF**)
If "ON", Zero signal of the sensors (pin 7 and 8 of CON5) is used to active Preset function (set datum on rising edge).
Recommended with "R" reference option.
OFF = Zero signal not enable
ON = Zero signal enable

Dir Counting direction [Up, Dn] (def: **Up**)
Sets counting direction of display.
Up = standard counting direction
Dn = inverted counting direction

Preset Datum value [-99999999, 99999999] (def: **0**)
Display can be set to datum value (or preset) by reset procedure.

Limit_P Limit switch + [-99999999, 99999999] (def: **0**)
Value of positive limit switch. Output OUT1 is active (ON) when actual position is higher than set value.

Limit_N Limit switch - [-99999999, 99999999] (def: **0**)
Value of negative limit switch. Output OUT2 is active (ON) when actual position is lower than set value.

Offset Offset value [-99999999, 99999999] (def: **0**)
Offset value (e.g. tool correction). This value is added to actual position by pushing ↑ key.
Position = actual position + offset value

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Enab. In Enable Input function [OFF, ON] (def: **OFF**)
If "ON", Preset digital input can be used to active Set datum function (see chapter 5.9).
OFF = Input not enable
ON = Input enable

Example:

The measurement values of a SME5-Y-2-10-I-2-B magnetic sensors has to be displayed.

D_type = M_Incr
Res = 0.01 mm
(= 10μm, sensor feature)
Unit = U_dec
Enable 0 = OFF
Dir = Up
Preset = 0
Limit_P = 0
Limit_N = 0
Offset = 0
Enab. In = OFF

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6.9 SIN/COS 1Vpp linear sensor

D_type Type of device [M_1VPP]
Type of used sensor.

Pitch Type of sensor/tape [10, 20, 25, 32, 40, 50] (def: **50**)
Sets the type of sensor and tape used (value indicates the pole pitch of sensor and tape in tenth of mm).
10 = MT10 tape (1 mm pole pitch)
...
50 = MT50 tape (5 mm pole pitch)

NOTE: with SMS Lika sensor set 10.

Res Resolution [0.005, 0.01, 0.02, 0.025, 0.04, 0.05, 0.1, 0.25, 0.5] (def: **0,001**)
Sets the linear resolution in mm to be displayed.
0,5 = 0,5 mm
...
0,001 = 0,001 mm

Unit Measurement unit [U_dec, Inch, Inch_F] (def: **U_dec**)
Sets display mode and measurement unit to mm, inch or fractional inches.
U_dec = mm
Inch = inch
Inch_F = fractional inches (eg. 12.31.64=12" $^{31}/_{64}$)

Enable 0 Enable Zero signal [OFF, ON] (def: **OFF**)
If "ON", Zero signal of the sensors (pin 7 and 8 of CON3) is used to active Preset function (set datum on rising edge).
Recommended with "R" reference option.
OFF = Zero signal not enable
ON = Zero signal enable

Dir Counting direction [Up, Dn] (def: **Up**)
Sets counting direction of display.
Up = standard counting direction
Dn = inverted counting direction

Preset Datum value [-99999999, 99999999] (def: **0**)
Display can be set to datum value (or preset) by reset procedure.

Limit_P Limit switch + [-99999999, 99999999] (def: **0**)
Value of positive limit switch. Output OUT1 is active (ON) when actual position is higher than set value.

Limit_N Limit switch - [-99999999, 99999999] (def: **0**)
Value of negative limit switch. Output OUT2 is active (ON) when actual position is lower than set value.

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Offset Offset value [-99999999, 99999999] (def: **0**)
Offset value (e.g. tool correction). This value is added to actual position by pushing ↑ key.
Position = actual position + offset value

Enab. In Enable Input function [OFF, ON] (def: **OFF**)
If "ON", Preset digital input can be used to active Set datum function (see chapter 5.9).
OFF = Input not enable
ON = Input enable

Example:

The resolution of 10μm has to be displayed using the following Lika sensor and tape: SMS-V-1-R-2 and MT10.

D_type = M_1VPP
Pitch = 10 (1mm, sensor feature)
Res = 0.01 mm
Unit = U_dec
Enable 0 = OFF
Dir = Up
Preset = 0
Limit_P =0
Limit_N = 0
Offset = 0
Enab. In = OFF

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6.10 Absolute linear SSI sensor

D_type Type of device [M_SSI]
List of parameters for absolute linear sensors and encoders with SSI interface.
This "device type" supports only the "LSB/right aligned protocol"

Format Number of clocks for SSI [25, 32] (def: **25**)
Sets the nr. of clock of SSI protocol.
25= 25 clocks (standard protocol)
32= 32 clocks (extended protocol up to 32 bits)

Steps Number of steps [0, 99999999] (def: **4096**)
Max number of information obtaining by absolute sensor.
Steps = 524288 for SMA5-GA-10 (2^19)
Steps = 1048576 for SMA5-GA-5 (2^20)
If you use SMA5- GA-5 the max steps are limited by characteristics of magnetic tape.

Res Resolution [0.005, 0.01, 0.05, 0.1] (def: **0.005**)
Sets the linear resolution in mm of the sensor connected to the display.
0,1 = 0,1 mm
0,05 = 0,05 mm
0,01 = 0,01 mm
0,005 = 0,005 mm

Code Encoder/sensor output code [Gray, Bin] (def: **Gray**)
Output code of the encoder/sensor.
Gray = Gray code
Bin = Binary code

Unit Measurement unit [U_dec, Inch, Inch_F] (def: **U_dec**)
Sets display mode and measurement unit to mm, inch or fractional inches.
U_dec = mm
Inch = inch
Inch_F = fractional inches (eg. 12.31.64=12" $^{31}/_{64}$)

Dir Counting direction [Up, Dn] (def: **Up**)
Sets counting direction of display.
Up = standard counting direction
Dn = inverted counting direction

Preset Datum value [-99999999, 99999999] (def: **0**)
Display can be set to datum value (or preset) by reset procedure.

Limit_P Limit switch + [-99999999, 99999999] (def: **0**)
Value of positive limit switch. Output OUT1 is active (ON) when actual position is higher than set value.

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Limit_N Limit switch - [-99999999, 99999999] (def: **0**)
Value of negative limit switch. Output OUT2 is active (ON) when actual position is lower than set value.

Offset Offset value [-99999999, 99999999] (def: **0**)
Offset value (e.g. tool correction). This value is added to actual position by pushing ↑ key.
Position = actual position + offset value

Enab. In Enable Input function [OFF, ON] (def: **OFF**)
If "ON", Preset digital input can be used to active Set datum function (see chapter 5.9).
OFF = Input not enable
ON = Input enable

Example:

Visualization of an absolute magnetic sensor, Lika type SMA5-GA-10-2.

D_type = M_SSI
Format = 13-25
Steps = 524288 (2^19)
Res = 0.01 mm (sensor feature)
Code = Gray (sensor feature)
Unit = U_dec
Dir = Up
Preset = 0
Limit_P = 0
Limit_N = 0
Offset = 0
Enab. In = OFF

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HW-SW	Man.Vers.	Description
1-1	1.0	1^ issue
1-3	1.1	HW-SW + manual update
1-3	1.2	OUT3 correction
1-3	1.3	LIMIt_P correction
1-4	1.4	Addition of RS232, Unit, Mod 360 LED1, Set datum function
1-6	1.5	Addition of Preset Input. Addition of Enable Zero signal on E_INCR and M_INCR. Addition of Dist_rev on E_SSI.
1-6	1.6	Preset input correction (chap. 5.5)
2-8	2.0	HW update: store position on power down. Addition of Enable Zero signal on E_1Vpp and M_1Vpp.
2-8	2.1	Chapter 5.6 update
2-10	2.2	SW update, manual revision

lika

Lika Electronic
Via S. Lorenzo, 25 - 36010 Carrè (VI) - Italy

Tel. +39 0445 382814
Fax +39 0445 382897

Italy: eMail info@lika.it - www.lika.it
World: eMail info@lika.biz - www.lika.biz

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